

What is claimed is:

1. A semi-solid metal (SSM) casting process, comprising:  
providing a metal and a vertical die casting machine,  
heating the metal to a chosen temperature,  
cooling the metal for a determined period of time to form a semi-solid metal, wherein the time can be zero; and  
casting the semi-solid metal in the vertical die casting machine.
2. An SSM casting process according to claim 1, wherein the metal is an Al-Si alloy.
3. An SSM casting process according to claim 2, wherein Al-Si alloy is a hypereutectic Al-Si alloy comprising more than about 11.7 weight percent Si in Al.
4. An SSM casting process according to claim 2, wherein Al-Si alloy is a hypoeutectic Al-Si alloy comprising less than about 11.7 weight percent Si in Al.
5. An SSM casting process according to claim 2, wherein Al-Si alloy is a 380 alloy.
6. An SSM casting process according to claim 1, wherein the vertical die casting machine is an indexing type vertical die casting machine.

7. An SSM casting process according to claim 5, wherein the vertical die casting machine is a 1000 Ton Shuttle Machine.

8. An SSM casting process according to claim 2, wherein the vertical die casting machine is an indexing type vertical die casting machine comprising a shot sleeve that indexes between a pour station and a transfer station requiring an indexing time.

9. An SSM casting process according to claim 5, wherein the temperature of metal is chosen such that the metal will form a semi-solid metal as it cools from indexing between the pour station to the transfer station..

10. An SSM casting process according to claim 8, wherein the indexing time is chosen to achieve a determined rate of cooling.

11. A means for SSM casting, comprising:  
providing a metal and a vertical die casting means,  
heating the metal to a chosen temperature,  
cooling the metal for a determined period of time to form a semi-solid metal, wherein the time can be zero; and  
casting the semi-solid metal.

12. A means for SSM casting according to claim 11, wherein the metal is an Al-Si alloy.

13. An A means for SSM casting according to claim 11, wherein the vertical die casting means is an indexing type vertical die casting means.

14. A means for SSM casting according to claim 13, wherein the vertical die casting means is a 1000 Ton Shuttle Machine.

15. A means for SSM casting according to claim 11, wherein Al-Si alloy is a hypereutectic Al-Si alloy comprising more than about 11.7 weight percent Si in Al.

16. A means for SSM casting according to claim 11, wherein Al-Si alloy is a hypoeutectic Al-Si alloy comprising less than about 11.7 weight percent Si in Al.

17. A means for SSM casting according to claim 11, wherein Al-Si alloy is a 380 alloy.

18. A means for SSM casting according to claim 11, wherein the vertical die casting machine is an indexing type vertical die casting machine comprising a shot sleeve that indexes between a pour station and a transfer station requiring an indexing time.

19. A means for SSM casting according to claim 11, wherein the temperature of metal is chosen such that the metal will form a semi-solid metal as it cools from indexing between the pour station to the transfer station..

Docket No. 87324.1780  
Customer No. 30734

PATENT

20. A means for SSM casting according to claim 11, wherein the chosen temperature is above the liquidus temperature of the metal.